

NOTES ON COCCID-INFESTING CHALCIDOIDEA.—III.

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Like the preceding instalment, this part deals mainly with species bred on the West Coast of Africa. I have to thank Dr. L. Masi, of Genoa, for fig. 4, illustrating the wing base of *Eusemion italicum*, Masi.

Coccidoxenus distinguendus, sp. nov.

♀. A blackish-brown species; vertex very dark metallic blue between the punctures, but narrowly gleaming in the front of the occipital edge. Antennae pale brownish, the funicle a little infuscated dorsally towards the apex, the sixth joint darker and the club distinctly so. Thorax: mesonotum metallic dark blue-green, dully shining before the scutellar suture, the scutellum from above dull, nearly black medianly, but the sides are shining metallic (see notes on sculpture). Propodeon and abdomen non-metallic. Wings like those of *C. obscuratus*, but the median cloud is darker, and the apex also beyond the lunar clear band is clouded, though not so darkly as the middle of the wing. Legs, from coxa to apex of femur blackish brown, the knees narrowly paler (very obscurely so in hind legs), fore tibiae pale, a little infuscated basally and along the dorsal and ventral edges, mid and hind tibiae dark with the apices broadly paler; tarsi pale, the fifth joint, claws, and empodia of all the legs a little darker.

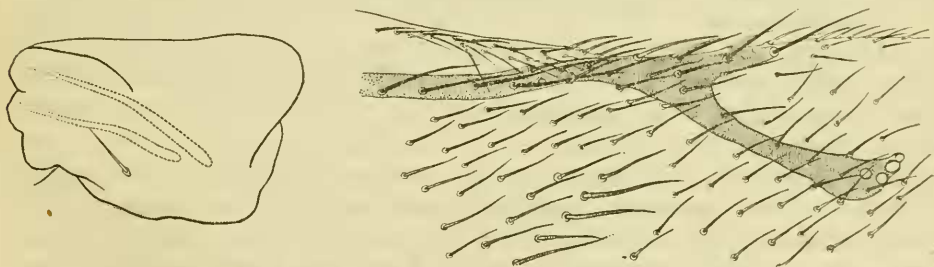


Fig. 1. *Coccidoxenus distinguendus*, sp. n., ♀; mandible and details of neuration.

Head (9:8). Eyes occupying five-ninths of the depth, seen from in front, large, with the orbits for one-quarter of the depth of the head below the anterior ocellus parallel (whereas in *coclops* and *obscuratus* the orbits diverge from that point). Toruli very distinctly below the base line of the eyes, separated by just over their length from the mouth-edge and one and a half lengths apart. Intra-torular area and clypeus flat. Punctuation moderate, coarsest along the orbits and on the vertex but much finer than in *obscuratus*; between the orbits, the anterior ocellus and the toruli, the surface is unpitted though rough; towards the genal keel the integument may be described as coriaceous.

Mouth-parts. Labrum almost as in *obscuratus* but a little narrower (1:5). The epipharynx (2:3) is oblong in both species, but longer (6:7) in *obscuratus*. Mandibles (fig. 1) of the same proportions as in *obscuratus*, tridentate, the teeth short

and broad, the middle one most prominent. In the maxillary palpus (20, 17, 15, 36) the fourth joint (3 : 1) is rather long. On the galea are, in all, about 40 external bristles, 15-16, apically stronger (in *coelops* nearly 60, in *obscuratus* upwards of 70 bristles).

Thorax. Pro- and meso-nota up to the suture regularly, rather finely transverse reticulate—the cells hardly raised. Mesonotum with about 100 bristles, which increase in size and are sparser towards the suture. The axillae (10 bristles), the mid-anterior half and a small pre-apical spot on the scutellum still with a fine reticulation, but the cell-walls much raised and refringent. Especially posteriorly, the cells on each side run together into long, thin ridges (about 12 deep) whose optical effect is a beautiful silky lustre. There are about 24 (12, 12) short bristles on the anterior half of the scutellum and about half that number widely spaced towards the apex where there are placed two approximated median bristles. Mesosternum medianly with a fine, raised pattern; pleurae smooth, with an extremely fine, close striation, a little coarser posteriorly.

Wings. Forewings, length 1.4 mm., breadth .56 mm., $2\frac{1}{2}$ times as long as broad, a little narrower than in *obscuratus*. The submarginal vein is very long, over 8 times the marginal, and about 5 times the slender radius. Marginal : radius : post-marginal, in the ratio 8 : 14 : 5. The postmarginal is thus a little longer relatively than in *obscuratus*, and the angle it makes with the radius is more acute than in either *obscuratus* or *coelops*. The submarginal vein with 12 bristles (18 in *obscuratus*); the 4 long apical inferior bristles on the submarginal cell are all closer set, otherwise the chaetotaxy round the marginal, etc., closely agrees with that of *obscuratus*, except that in the latter species there are more bristles beyond the radius (fig. 1). Behind the submarginal vein is a complete row of short bristles, mainly coloured (2-3 beyond the middle of the submarginal, hyaline); behind this row again is an incomplete row of 4-5 bristles (in *obscuratus* about 3 complete rows), thence to the hind edge of the wing bare (about a dozen hyaline bristles in *obscuratus*). On the edge of the patch of bristles below the marginal and uprise of the submarginal proximally and posteriorly are about 20 weak hyaline bristles (70-80 in *obscuratus*). Hindwings narrow, length .93 mm., breadth .26 mm., about $3\frac{1}{2}$ times as long as broad (3 in *obscuratus* and *coelops*); 9 minute bristles in submarginal cell and 6-7 at the hooks.

Legs. Fore-legs with coxa slightly narrower than in *C. obscuratus* and bearing posteriorly and subdorsally above the trochanter a patch of only 10 short bristles (26-28 in *coelops* and *obscuratus*). In the tarsus the first joint is longer than the fifth (7 : 6). In the mid legs the tibia bears anteriorly on the apical edge 8 peg-like spines, and there are on the first four tarsal joints respectively 19, 10, 10, 7, similar spines (in *obscuratus* 32, 13, 12, 9-10). The tarsus is moderately bristly, *e.g.* on the posterior aspect of the first joint there are about 5 longitudinal rows of bristles containing in all about 50, while 12-13 of the plantar bristles are spinose (in *obscuratus* about 70, and 15-16; in *coelops* about 30, and 12-13). In the hind leg the tibia is distinctly narrower (70 : 9) than in *coelops* (57 : 9) or *obscuratus* (65 : 10). The comb contains 16-17 spines and 10 of the plantar spines (single or double) are stronger (13-15 in *coelops* and *obscuratus*).

Abdomen. The second tergite bears on each side a narrow belt of small refringent cells. The fifth sternite broad, acuminate, with a slight, minutely bilobed apical furrow; on each half of the sclerite there are about 45 bristles—20 more minute towards the base, the remainder mainly on the distal half.

Length, over 1.6 mm.; alar expanse, about 3½ mm.

GOLD COAST: Aburi; (a) reared from female of *Lecanium* sp. on coffee, 19. xii. 15, 2 ♀♀; (b) reared from *Lecanium subhemisphaericum* Newst., sp.n.,* on coffee, 27. xii. 15, ♀ (*W. H. Patterson*).

Type ♀ in the British Museum (one of the pair (a) noted above).

The species of *Coccidoxenus* appear to be numerous and closely related to one another. The species just described should be known at once by the mandibles, but unfortunately in few of the extant descriptions of members of the genus are the mandibles referred to at all.

***Aethognathus afer*, Silv.**

Aethognathus afer, Silvestri, Boll. Lab. Portici, ix, 1915, p. 352, figs. 13–14. Described from Aburi, Gold Coast, the host being *Stictococcus diversiseta*, Silv.

***Aethognathus afer*, var. *cavilabris*, nov.**

♂♀. Generally darker (distinctly blackish) than the West African race, from which it differs little superficially except in the slightly coarser puncturation of the vertex, e.g., in *afer* there are about 8 punctures between the posterior ocelli (6 in v. *cavilabris*) and 16 along the occipital edge (12 in v. *cavilabris*).

UGANDA: Entebbe, from *Stictococcus dimorphus*, 9.viii.1912, 2 ♂♂, 9 ♀♀ (*C. C. Gowdey*).

Type ♀ in the British Museum.

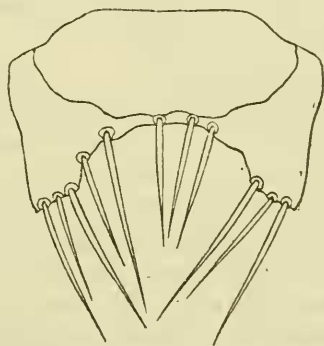


Fig. 2. *Aethognathus afer*, Silv., var. *cavilabris* nov.; labrum of ♀.

I had determined the above material as *A. afer*, but on making complete dissections found that the labrum (fig. 2) in both sexes lacked the conspicuous median lobe of the West Coast form (*loc. cit.* fig. xiv, 4). Professor Silvestri tells me that additional dissections of the type material prove that the difference is

* See below p. 363.

constant. At present it seems best to consider the Eastern and Western forms as local races of one species. Besides the differences already noted there appear to be others in the ratio of the antennal joints; *e.g.*, the club of the antenna is relatively longer in typical *Afer* than in the var. The lighter coloration of the Aburi examples may be due in part at least to preservation in alcohol. Through the kindness of Professor Silvestri a cotype of *A. afer* has been presented to the Imperial Bureau of Entomology, and a cotype of var. *cavilabris* has been deposited at Portici.

Genus EUSEMION, Dahlb.

Eusemion, Dahlbom, Oefv. Svensk. Vet.-Akad. Förh., xiv, 1857, p. 293.

Although considered by Mayr to be equivalent to *Cerapterocerus*, Westw., this group probably deserves separate treatment. It is distinguished by the rather broad sub-triangular wing, the large single cloud, and the neuration, the marginal being rather long, and the postmarginal and radius, though short, both distinctly developed.

***Eusemion cornigerum*, Walk.**

Encyrtus corniger, Walk., Ent. Mag., 1838, p. 114.

♀. Blackish brown; antennae, especially on the scape, with a slight cupreous gleam; eyes dark chocolate; vertex and upper frons refringent, dark metallic green. Thorax slightly darker than the abdomen, with at most a trace of metallic reflection (greenish) apically or marginally towards the apex. Wings with the veins blackish brown, pattern as in fig 3, *a*, the cloud being darkest immediately behind the costa between the postmarginal and the apex of the wing. Legs with all the fifth tarsal joints, claws, and empodia darker; remainder of the tarsi, apices of tibiae (broadly) and the spurs pale, otherwise nearly as dark as the abdomen and nowhere metallic.

Head very much wider than deep across the lower face (17 : 14); eyes in profile occupying four-sevenths of the depth. Vertex slightly broader than in *E. pattersoni*, Waterst. (two-ninths the width of the head). Ocelli in an isoseles triangle so short as to be almost equilateral; posterior pair nearer to one another than to the anterior ocellus, and separated from the margin of the vertex by little more than their own length. Between the anterior ocellus and the edge of the frontal flattening there are four rows of punctures, the middle pair containing 5-6 large and conspicuous ones; along the orbits the rows are obscure and consist of smaller, less conspicuous punctures. Toruli oval, sub-reniform in shape, the opposed edges being flatter and a little concave medianly. Genal striae rather coarse, 4 bristles above the genal edge. Between and above the toruli are about 16 bristles.

Mouth-parts. Labrum distinctly concave, with 8 bristles. As the upper margin of the chitinised area is also concave, the dissected labrum has the shape of a bi-concave lens. Mandibles (7 : 5) tridentate (fig. 3, *d*). Maxillary palpus 15, 10, 10, 21; in same ratio the breadths are $5\frac{1}{2}$, 7, 6, 9. There is a strong bristle on the stipes well before the palpus and two shorter (median) on the mentum.

Antennae (fig. 3, *b, c*). The pedicel though compressed is almost normal, and the club is much more distinct from the funicle than in either *E. pattersoni* or *E. italicum*.

Thorax. Reticulation of the mid lobe as coarse as that of the scutellum generally and coarser along the mid line. Bristles much fewer than in *pattersoni* (e.g., in front of the suture there are in *pattersoni* about 12, in *cornigerum* about 6 bristles); on the scutellum also the bristles are fewer (about 7 or 8 on each side of the mid-line, 20 : 20 in *pattersoni*) and the sensory pustules are at one-third from the hind

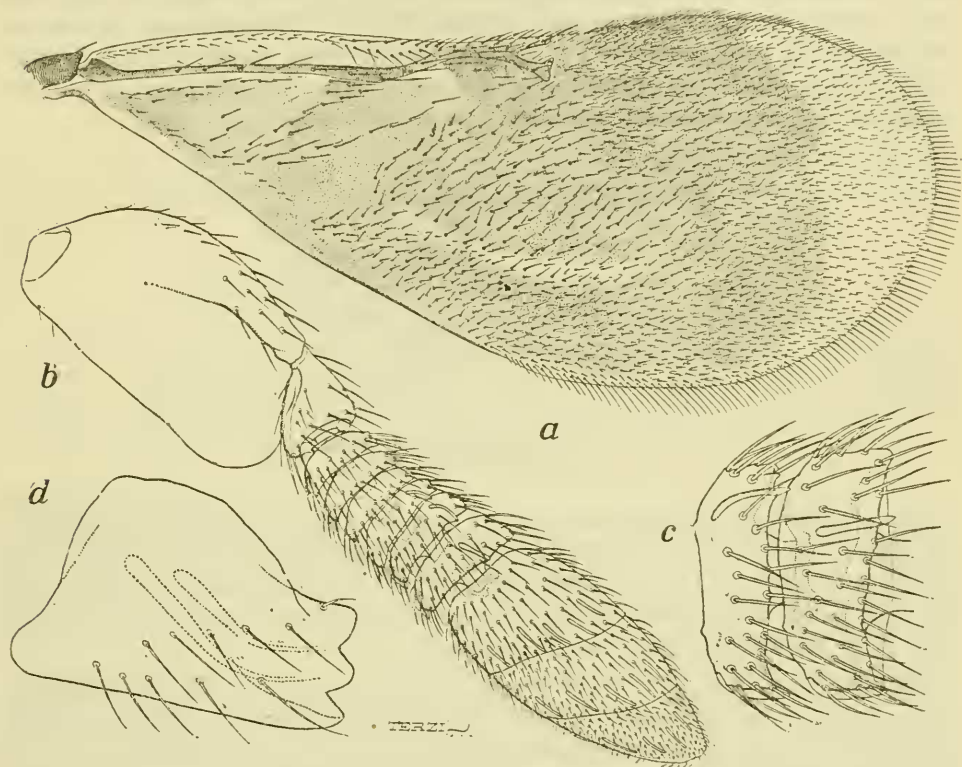


Fig. 3. *Eusemion cornigerum*, Wlk., ♀; (a) fore wing, (b) antenna, (c) fifth and sixth funicular joints, (d) right mandible.

edge. On each side of these pustules the apical one-third of the scutellum is smoother with, under a moderate power (up to $\times 80$), a number of minute black dots surrounded by a more shiny area; when rendered transparent, mounted in balsam, and highly magnified these dots appear to be the external openings of tube-like sensory (?) structures (30-40 in all). Each structure lies at the angle of a cell in the reticulation and stretches forward anteriorly through the chitin. No sensory bristles are however visible, even with a magnification of over 600. Besides the bristles already noted, there are two longer, stouter ones apically in the middle (1, 1).

Metanotum in two triangular portions each of which shows anteromedianly 3-4 very short longitudinal rugae and about the same number transversely

situated. Propodeon with 3 short descending median rugae flanked on each side by one or two incomplete cells; 3-4 rugae before the spiracle, which is nearly circular and of moderate size. Metapleurae with 9-10 bristles.

Wings. Fore wings (fig. 3, *a*) $2\frac{1}{2}$ times as long as broad, length 1.07 mm., breadth .43 mm. Submarginal : marginal : radius : postmarginal, as 40 : 10 : 5 : $3\frac{1}{2}$; *i.e.*, the marginal is relatively longer than in *E. pattersoni*. Compared with that species also there are 1-2 fewer bristles on the submarginal vein and all the major bristles on the neuration are a little shorter; 2 bristles on the radius, 1 near base and 1 sub-apical; 6-8 long bristles inferiorly at the apex of the submarginal cell. The conspicuous differences in the chaetotaxy of the wing-bases of *cornigerum*, *italicum* (fig. 4) and *pattersoni* are figured. Hind wings, length .78 mm., breadth .19 mm.; 11 bristles on apical half of the neuration. Both wings, especially the posterior pair, are distinctly narrower than in *pattersoni*.

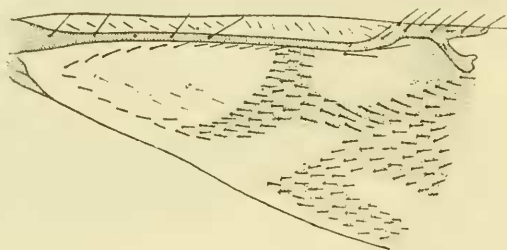


Fig. 4. *Eusemion italicum*, Masi, ♀;
basal half of fore wing.

Legs. Fore legs with the femur (4:1) broader than in *pattersoni*. Femur of mid legs a little over 5:1; the tibia not quite $5\frac{1}{2}$ times as long as broad; apparently fewer heavy spines on the first tarsal joint. Hind tibial comb as in *pattersoni*. The first and second tarsal joints of the mid and hind legs are in ratio 3:2, the first joint being relatively shorter than in *pattersoni*.

Abdomen (9:8) with the sheath projecting between one-seventh and one-eighth of the length of the abdomen. Dorsal surface medianly smooth, faintly reticulate laterally and narrowly towards the middle behind the setigerous process. On the first tergite are two narrow transverse widely separated belts (each occupying about one-third of the total breadth) of small much raised cells with thickened walls, which produce a slight refringence.

Length, about 1 mm.; alar expanse, $1\frac{1}{2}$ -2 mm.

BRITAIN: Surrey, Camberley, bred from the Coccid *Parafairmairia gracilis*, viii. 1915, 4 ♀♀ (*E. E. Green*).

There are apparently no Walkerian examples of this species in the British Museum, and I am not aware of any recent records of *E. cornigerum*. Haliday's figures (*Entom.*, 1841, pl. II., figs. 2, 2, *a*), though on too small a scale to convey much information, are fairly satisfactory. Walker records the species from the Isle of Wight and Fontainebleau. Mayr (*Verh. zool.-bot. Ges. Wien*, xxxv, 1876, p. 749) records *cornigerum* from Coccids on *Prunus* and states that Kreichbaumer reared a female from a Coccid on grass. *Parafairmairia* is also a grass Coccid.

In a recent letter my friend, Dr. L. Masi, suggests the name *italicum*,* Masi, for the species which I have already discussed (Bull. Ent. Res., 1916, p. 249). *C. laterivittatus*, A. Costa (1882), has probably nothing to do with *italicum*. Dr. Masi has recently ascertained that Costa's type is lost.

The following key to the females of *Eusemion* may be given:—

Mandibles tridentate; club of antenna distinct, funicular joints gradually expanded, the sixth widest *cornigerum*, Wlk.

Mandibles bidentate (the two upper teeth being fused into a broad cutting edge); club and funicle band-like, the former indistinctly separated, only the first normal funicular joint a little narrower, 2-6 equal in width.

Scape subquadrate, large, its greatest length (from head of the bulla to the antero-ventral angle) just equal to the funicle measured along the dorsal edge *italicum*, Masi.

Scape subtriangular (its dorsal edge convex), smaller, only as long as the first four funicular joints *pattersoni*, Waterst.

Genus HABROLEPIS, Först.

Habrolepis, Förster, Hym. Stud., ii, 1856, p. 34.

Four species of this remarkable genus have been described, and only one as yet from Africa (*H. oppugnati*, Silv., Boll. Lab. Portici, 1915, p. 299, figs. lv and lvi). From *H. oppugnati* the present species differs conspicuously in the antennae, especially in the funicle. Professor Silvestri's species was reared from *Aspidiotus oppugnatus*, Silv., found at Nefasit, in Eritrea.

Habrolepis apicalis, sp. nov.

♂. Blackish brown, the head and thorax a little darker than the abdomen, the under surface of which is slightly lighter than the upper. Wings hyaline; veins of forewings yellowish, with only a faint and limited clouding about the marginal. Trophi anteriorly pale; cardo, stipes and mentum smoky. Antennae with the bulla and scape whitish, the rest yellow, tinted; pedicel (especially superiorly) and funicle faintly embrowned; apical fourth of the club with a distinct brown spot. Fore legs pale yellow; the tibia narrowly and indefinitely near the base along the dorsal edge and the tarsi a little embrowned. Mid legs purer yellow, with brown coxae, and faintly banded with the same colour for one-fourth the length, beginning at one-fifth from the base. Hind legs mainly brown; the trochanters, bases of femur and tibia (narrowly) and apex of tibia (broadly) paler. Tarsi hardly so dark as the femur.

Head, from in front, broader than long (11:9); eyes rather small, wide apart, separated at the anterior ocellus by about one-half and on the base line by six-sevenths of the width of the head. Toruli mid-way between the anterior ocellus and the clypeal edge and well above the base line of the eyes, large, oval, equidistant superiorly from one another and the orbits. Clypeal edge concave. Pattern of face distinctly raised, coarse, everywhere transverse. Five pairs of bristles between and below the toruli and another pair on the clypeus well above the edge; on

* See Masi, Ent. Mo. Mag. (3) iii, April 1917, p. 80.

each side of the clypeus up to the genal keel 9–11 bristles, 3 being before the keel, 5–6 along each orbit up to the level of the toruli. The eyes bear scattered very minute bristles. Vertex and upper frons very strongly raised reticulate so as to appear rough-pitted; lateral ocelli just over one-half their diameter from the orbits.

Mouth-parts. Labrum narrow, two-fifths the width of the clypeal edge, with a rather stout bristle at each lateral angle and two clear pustules medianly above the edge. Mandibles (fig. 5 *b, c*). Maxillary palpus, 10 : 7 : 9 : 17 (measured along the outside edge); first joint triangular, constricted basally, bare, as also is the second; the third with two bristles; fourth joint (as wide as the length of the second) with about a dozen bristles evenly distributed and 3 much longer (hyaline) at or near the apex. The galea bears 8–9 shorter superficial bristles and 6–7 more spine-like ones on or near the edge. Labial palpus, 8 : 2 : 7; the second joint hardly discernible on the inner edge.

Antennae (fig. 5, *a*). Length .55 mm., bulla (6 : 5) two-fifths of the scape, which is, as in *H. dalmani*, Westw. (*Philos. Mag.*, x, 1837, p. 440), nearly twice as long as broad. Pedicel about as long as the scape is broad, hardly longer than broad (17 : 15) and shorter (17 : 20) than, but as broad as, the first normal funicular

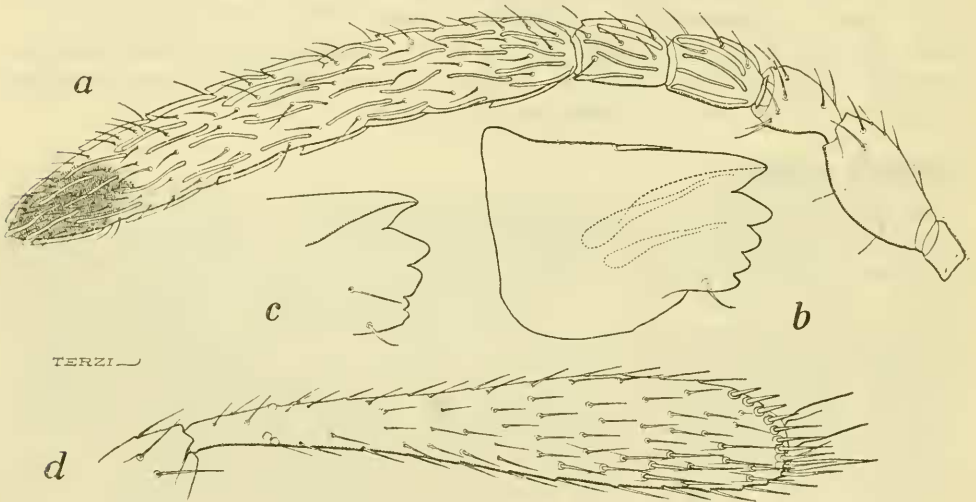


Fig. 5. *Habrolepis apicalis*, sp. n., ♂; (*a*) antenna, (*b*) and (*c*) mandibles, (*d*) hind femur, posterior aspect.

joint, which in turn is shorter than the second (20 : 23); ring joint minute. The two funicular joints (as long as bulla and scape together) are, with the club, in the ratio 5 : 6 : 35. Taking the width of the funicle as 3, that of the club at its maximum is about 4. The sensoria of the funicle and club are long and numerous; the bristles are sparsely set (fig. 5, *a*).

Thorax just longer (9 : 8) and wider (10 : 9) than the abdomen, which is as broad as the head. Pronotum with the spiracular emargination small, shallow and indistinct, with 1 strong and 1 weaker bristle above the posterior row (6, 6), and

8–10 shorter ones in front and 4–5 minute scattered bristles towards the mid-line; overlaps bare, the reticulation very large and drawn out; mesoscutum broader than long (9 : 7) and longer than the scutellum (7 : 6), with about 30 stiff bristles on each side of the mid-line; axillae with 2–3 bristles; scutellum with 10 bristles in two curved lines (3, 2) about the mid-line. The sensory pustules far back at three-fourths from the suture; the hindmost pair of bristles stronger and longer. About one-sixth of the scutellum overhangs the metanotum. The propodeon consists of two narrowly connected quadrate areas; spiracle oval, one exterior bristle; metapleurae bare. The entire notal pattern boldly raised; on the mesoscutum the reticulation is large and regular, a little smaller, but more pitted on the mid-scutellum, but more scaly towards the sides; on the axillae scaly, tending to rugulose; metanotum and propodeon transversely rugulose, only a small spot inside each spiracle smoother. Mesosternum finely transverse-reticulate, little raised, mesopleurae mainly finely striate-reticulate, but the pattern anteriorly and again near the posterior edge larger and more regularly reticulate. Tegulae and prepectus both rather large, with the large boldly raised pattern in the latter divided into equal triangular areas by the internal incassation.

Wings. Forewings, length .68 mm., breadth .28 mm. (excluding fringe). Similar to those of *H. oppugnati*, Silv., but differing as follows: in the forewing (cf. l.e. fig. lvi, 2) the terminal ventral bristle of the postmarginal shorter and finer than the 6 fringing the marginal and postmarginal above. Only 5 sloped transverse rows of discal ciliation below the uprise of the marginal vein. Hindwings, length .4 mm., breadth .09 mm.

Legs remarkable for the great development of the middle pair, which when fully extended are nearly as long as the entire insect, half as long again as the fore legs or about one-fourth longer than the hind legs. Fore legs: coxae (4 : 3) with about a dozen external bristles, some heavier, ventrally, and on inner surface a distinct patch (5–6) of minute bristles medianly; femur 4 : 1, tibia rather broad (10 : 3), the spines of the apical comb (5) long and thin; comb of first tarsal joint (5 spines) confined to apical half. Mid legs: coxae elongate, with about 16 external bristles, the reticulation of longish, distinctly raised cells; femur (23 : 3) just shorter than the tibia (at base 10 : 1, at apex 6 : 1), with 4 short peg-like spines anteriorly at apex, the upper angle of which is heavily chitinised; spur $\frac{2}{3}$ of the first tarsal joint, which bears antero-ventrally 7 very stout spines, of which joints 2–4 bear 2, 1, 1 respectively. Hind legs: coxae broad (8 : 7), with 3 stronger external bristles above the trochanter and about 20 in front; tibia extremely narrow (17 : 1) at the base and then expanded like a club to about 5 : 1 at one-fourth from the apex; the apical comb extends backwards shortly and contains 10 spines.

Abdomen. Medianly smooth, the tergal overlap striate. Tergites 1–6 medianly subequal in length; 1–4 with straight hind margins; 5 and 6 posteriorly convex; 7 half longer than the others, straight-edged; 1–6 bear at each side 3–4 bristles, forming a complete row on the sixth, widely separate on 1–4; the seventh bears about 15 bristles (3 rows). Spiracle minute, circular; the spiracular pleurite nearly separate from the tergal portion, with 7–8 bristles posteriorly. The overlaps of tergites 2–5 show 1–2 pustules, which may be setigerous, but if so, in neither specimen have the bristles persisted. The process on tergite 7 distinct,

broad, with 5 bristles, 2 outer short, the innermost moderate, and the central pair long, exceeding the tip of the abdomen and reaching to about the level of the penis hooks when the genitalia are exerted. The lateral hooks of the penis single, short and thick.

Length, .7–.75 mm.; alar expanse, 1.45 mm.–1.55 mm.

GOLD COAST: Aburi, ex *Chionaspis minor*, 19. v. 16, 2 ♂♂ (*W. H. Patterson*).
Type. ♂ in the British Museum.

Genus ASPIDIOTIPHAGUS, Howard.

Aspidiotiphagus, Howard, *Insect Life*, vi, 1894, p. 230.

Aspidiotiphagus citrinus, Craw, *Destructive Insects*, Sacramento, Cal., 1891, p. 28, fig.

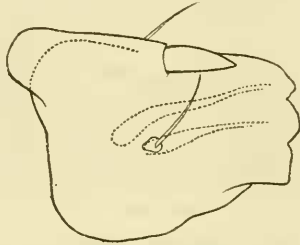


Fig. 6. *Aspidiotiphagus citrinus*,
Craw, ♀; mandible.

The following examples of this species have been received by the Imperial Bureau:—

CEYLON: Peradeniya, ex *Chionaspis graminis*, 24.vi.13, 2 ♀♀ (*A. Rutherford*).

RHODESIA: Salisbury, ex *Aspidiotus camelliae*, 16.ix.09, 5 ♀♀ (*R. W. Jack*).

GOLD COAST: Aburi, ex *Chionaspis minor*, 19.1.16, 2 ♂♂, 7 ♀♀ (*W. H. Patterson*).

The above specimens agree very completely amongst themselves and with a single female in the British Museum (determined by Dr. L. O. Howard) from Grenada (*Howard*, *Linn. Soc. Lond., Zool.*, xxvi, 1896, p. 156).

Family MISCOGASTERIDAE.

Although the genus described below has been known to me for some time, I had not ventured to regard it as new till lately, when Mr. A. A. Girault returned an example of the genotype as unknown to him. The systematic position of *Eriaporus* is a little uncertain. It is formally a Miscogasterid and Mr. Girault would go further and assign it a place in the PIRENINAE. But the three-jointed maxillary palpus and the deeply advanced axillae are anomalous for the subfamily, so far as I know it.

Genus ERIAPORUS, nov.

♀. *Head*, from in front, broad, contracted towards the mouth-edge. Clypeal edge straight medianly, horizontal; sides straight, sloping towards the genal keel. Toruli quadrangular, superiorly truncated, placed just clear of the base line of the eyes; post-scapal hollows deep, inclined at an acute angle towards one another and meeting in front of the anterior ocellus. The area actually

between the toruli flat and raised, but coming to an acute pointed ridge superiorly, where the scapal grooves coalesce. Frons and vertex broad; occiput and vertex meeting in a distinct edge, which is not however chitinised, ridged or internally thickened. Eyes moderate, a little prominent, bare. Vertex and frons with a few remarkable stout curved spine-like bristles in addition to others of a more usual calibre.

Antenna 9 (11)-jointed: scape, pedicel, 2 ring-joints, 4 in funicle, club with 3 segments, the distal suture indistinct.

Mouth-parts. Labrum oblong, straight-edged, mandibles bidentate, the upper tooth with broad edge. Maxillary and labial palpi both 3-jointed.

Thorax. Pronotum broad, not deeply emarginate antero-medially; spiracular emargination very small; postero-lateral angles extending considerably beyond the hind marginal row of bristles. Prosternum pentagonal, the postero-lateral edges practically in one line, with distinctive apophysis. Mesonotum with the parapsidal furrows straight, distinct and deep; mid-lobe with numerous stout bristles; parapsides with a longitudinal row of 5 spinose bristles and 3 even stouter before the tegula, deeply invaded by the axillae, which bear several spinose or weaker bristles. Scutellum with 6 bristles (3, 3); the 2 sensory pustules minute and posterior; mesophragma very short, apically bilobed. Prepectus quadrate, with a narrow median connection; pleurae distinctly impressed; a strong internal chitinisation from the antero-ventral angle of the episternite to the insertion of the mid-coxae. Epimeron separated off by an incrassation, except just above the coxae. Metanotum and propodeon broad, narrow, medianly carinate.

Wings. Forewings with the junction of marginal and submarginal thickened; marginal long; postmarginal and radius well developed, subequal; submarginal with long stout bristles; submarginal cell rather deep. Basal area of wing bare. Hindwings with the hind margin very concave near base.

Legs. Fore legs with one stout long spinose black femoral bristle, subapical and ventral; first tarsal comb not transverse, lateral but occupying the mid half of the ventral edge. Mid legs with 2 heavy subapical spinose femoral bristles and a rather weak long frayed tibial spur. Hind legs with the coxae large and broad; femora with a distinct antero-ventral groove on apical two-thirds, receiving the folded tibia, the edge posteriorly flattened; tibia bicalcarate. In all the tarsi the first joint is long, and the fifth somewhat expanded.

Abdomen. Segments sub-equal, the first shorter than 2-4. Free portion of the sheath short in proportion to the base.

Eriaporus laticeps, sp. nov.

♀. Vertex and frons pale yellowish; antennae pale with a reddish brown tinge on the scape, the funicle more or less infuscated, especially on the club; ocelli chestnut brown, eyes darker, occiput blackish brown, genae yellowish brown, mandibles pale, brown-tipped. Thorax and abdomen blackish brown, but the tegulae distinctly pale and the anterior edge of the pronotal collar narrowly lighter. On the first visible abdominal segment are two large yellow spots, separated medianly by rather less than their own breadth of the ground-colour,

each spot containing antero-laterally a much smaller paler indefinite brown mark. The wings are hyaline, clouded narrowly at the junction of the submarginal and marginal veins; neuration very pale brown. Fore coxae pale, hind coxae concolorous with thorax, mid coxae pale, slightly darker externally; otherwise the legs are very pale, only the claws embrowned.

Head, from in front, very broad (4 : 3), mouth-opening moderately narrow; the space between the extremities of the genal keel four-fifths the shortest distance across the frons. Eyes moderate, occupying three-fifths of the depth. Frons broad, the orbits continuously rounded, at their nearest over one-third (6 : 15) of the entire width of the head, the distance increasing on the base line to about three-fifths; frons ventro-laterally well developed, the genal keel far back, with the lower rounded angle of the eye in front. Toruli (8 : 5) with the inner sides subparallel, $2\frac{1}{4}$ times their own length from the clypeal edge, a little more than their own length (9 : 8) apart, and about $1\frac{1}{2}$ times their length from the orbits. Reticulation rather large, distinct and regular, especially superiorly, flowing round the toruli ventrally, where it becomes faint. In each upper frontal angle are 4 stout coloured spinose bristles, 2 standing on the upper orbit. There are no well-differentiated orbital bristles, but 7-8 minute and weaker ones stand in the place of the usual row, with about as many more towards the outside of the scapal groove; similar weak bristles (4-5 pairs) between the toruli. About the mid line on each side below the toruli, the lower frons bears 8-10 weak minute bristles, and there are 4 (2, 2) well above the clypeal edge, the middle pair stronger. In profile the head is antero-posteriorly thin, the genae proper flattened; from above the head is lenticular, markedly concave posteriorly, the occipital edge decided. Ocelli in a broad triangle, the posterior pair on the occipital edge, with two stout bristles between. On each orbit vertically are two more stout bristles in addition to those already mentioned.

Antennae. Length .75 mm. Bulla short, transverse, narrower than scape basally. Scape (6 : 5) tapered neither at base nor apex, longer than the club, and as long as the pedicel, ring joints, first and one-third of the second funicular joints. Pedicel (5 : 3) half as long as the scape. Ring joints distinct, the edge of the second (distal) covered on the inner aspect by a flange of the first; funicle cylindrical, joints subequal, the first and second just longer than wide, third and fourth just transverse; the club (5 : 5 : 3) wider (7 : 6) than the last joint of the funicle and exceeding the length of the last two funicular joints together. The scape externally with a coarse pattern, with 7-8 oblique transverse rows of bristles (2-4 per row) and densely clothed on the inside with minute stiff bristles along the dorsal half to two-thirds ventrally and subventrally bare; on the inner aspect at the apex 2 stout spinose bristles; pedicel with several scattered bristles, 1 stouter and spinose externally before the upper apical angle; both ring joints with a marginal row of stiff spinose bristles; on the funicle the bristles are mainly spinose and curved, with numerous small "mushroom" bristles, presutural in position. The sensoria low and not produced apically, 6-8 on funicle joints, and about a dozen on the first club segment.

Mouth-parts. Labrum with four bristles; stipes with a bold pattern and 3 bristles; maxillary palpus (8 : 5 : 7), the first joint with 1 bristle beyond one-half and 1 clear

pustule apically; second joint with 5 bristles and a pustule; third with 8-9, one at apex longer than the joint. Mentum with 5-6 bristles about the mid-line. Labial palpus (10:6:9), the middle joint simple, transverse, as wide on the inner edge as on the outer; two setigerous cells on the ligula, the setae flat and broad. Mandibles moderately long, considerably contracted distally; at base (7:5), at apex (7:3), ventral edge straight.

Thorax. Pronotum with 1 strong spiracular bristle, about 10 (5, 5) on hind margin; between the spiracular bristle and the last of the posterior row 3 weaker bristles; in front of the posterior row about 15 minute ones in a row; anteriorly on each side of the mid line about 14 bristles mainly in two patches far apart, though one or two stand near the middle. Mesonotum (12:11) very broad; mid lobe much broader than long (4:3), and just equal to the scutellum in length, with

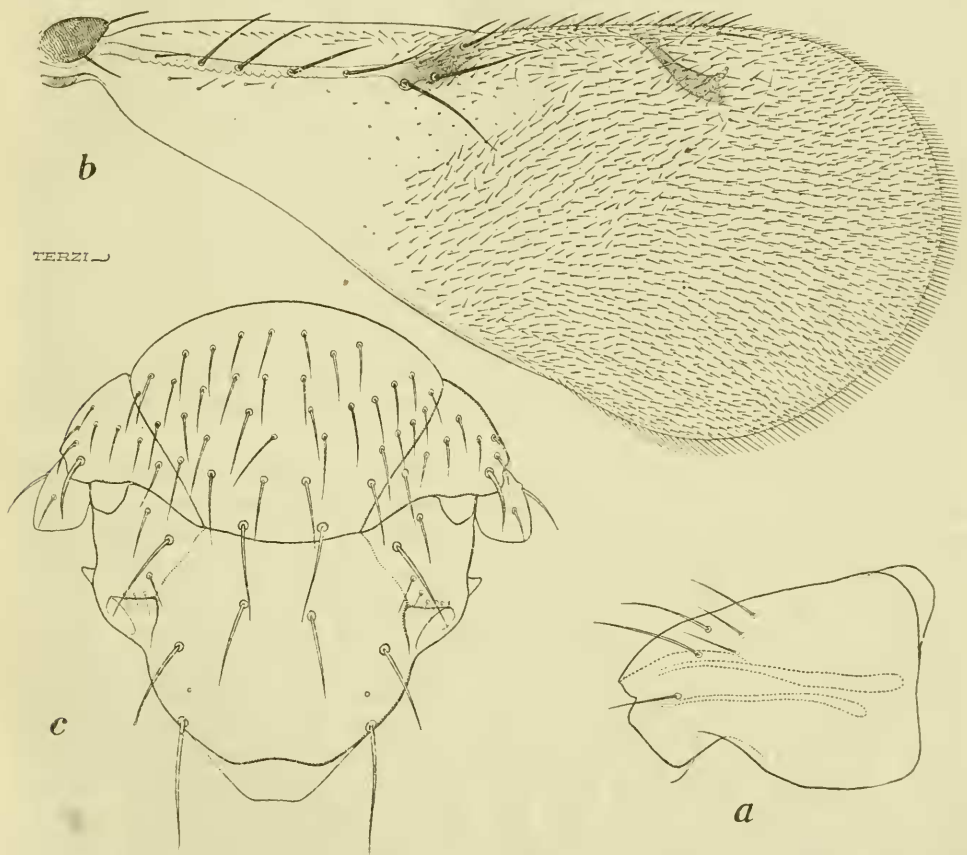


Fig. 7. *Eriaporus laticeps*, sp. n., ♀; (a) mandible, (b) right fore wing, (c) mesonotum (a little flattened to show complete chaetotaxy).

about 35 stiff bristles, of which 2 placed almost on the suture dividing the base of the lobe in ratio 5:7:5 are stronger. Axillae large, with one longer bristle at inner angle, another shorter well in advance, and 4-6 much shorter along the hind margin. Scutellum with 2 (1, 1) stout bristles overhanging the propodeon, another similar

pair in front, and a third pair inwardly displaced at one-third from the suture. The clear sensory pustules are minute, one on each side between but a little inside the lateral bristles. The projecting part of the mesophragma is only about one-seventh of the scutellum in length. Sternopleurae ventrally flattened and expanded antero-laterally, the divide between the pleural and ventral areas of the sternum proper occurring along the thick ridge extending from the mid coxa to below the episternite. The distance between the anterior extremities of these ridges, when the sternopleurae are flattened out, is about twice (17:9) that between the hind ends. Between the anterior end of the ventral ridge and the episternite one moderately long weak bristle; one at each postero-lateral angle of the sternum, and a median pair both anteriorly and posteriorly at the edge about the mid line, the former rather widely separated. In the middle the post-scutellum is overhung for the greater part by the scutellum, the concealed part being pentagonal in shape, with a broad median thickening in line with the propodeal keel; the exposed part consists of two narrow descending rugulose areas touching medianly. The sunken side areas are bounded laterally by distinct ridges, besides being incompletely divided by ridges rising from the lateral ends of the rugulose areas but fading out half-way towards the sides. Propodeon broadly smooth medianly, except for one or two raised cells in the antero-median angles. The keel (highly magnified) consists of two closely applied ridges. From half-way between the median keel and the spiracle the surface shews a strongly raised, coarse, rather thick-walled reticulation, which extends on to the metapleurae. There are no pre-spiracular lateral keels, but posteriorly (from one-half to the hind margin) there is a short thickened fold in the chitin. Spiracle moderately large, oblong oval, lying on the edge of a distinct elongate sulcus; 12-15 bristles outside the spiracle. The propodeon is laterally ridged and expanded, with the postero-lateral angles right angles, and the sides a little convexly convergent.

Thoracic sculpture. Pronotum with the reticulation decided and raised, cells of moderate size, quadrate or pentagonal, mainly oblong-transverse, the largest and most feebly marked antero-ventral. Prosternum with the somewhat large cells radiating antero-laterally from the mid line. Mesonotal pattern finer, nearly everywhere regular (coarser anteriorly on the mid lobe and laterally on the scutellum); all the cells with slightly thickened raised walls, hexagonal. On the sternopleurae the pattern is rather faint, except on the postero-median half of the mesepimera, where there are a number of coarse raised cells in an irregular patch, with one or two striae above and some incomplete cells towards the mid-coxae; otherwise the epimeron is smooth, *i.e.*, the femoral impression is posteriorly gleaming. Below the forewing the upper portion of the episternite is weakly, finely striate, nearly smooth. The rest of the sternopleurae shew a regular moderate reticulation, more pronounced on the sides of the thorax, with a small smooth spot (behind one-half) on the rounded edge immediately below the incrassation from the mid coxae. The prepectus has a coarse delicately impressed reticulation.

Wings. Forewings (fig. 7, *b*) very broad, the length only a little over twice the breadth; length 1.25 mm., breadth .57 mm. Hindwings about $3\frac{2}{3}$ times as long as broad, length .98 mm., breadth .27 mm., deeply concave on basal one-third of

hind margin; with 18–20 longish bristles on the narrow submarginal cell, 5 short bristles at the hooks; discal ciliation short, regular, only the base narrowly bare.

Legs. Fore legs with the coxae (20 : 11) large, five-sixths of the femur in length, pattern coarse, transverse and scaly on the outside, with 3 long bristles ventrally and about a dozen above; femur (8 : 3) covered with minute bristles on the posterior aspect, on dorsal two-thirds 2–8 deep and ventral bristles, 3–4 deep, longer and more widely spaced; anteriorly 1–2 subventral rows of minute bristles, with many more on apical two-thirds from dorsal edge to below half; tibia (4 : 1) with the apical comb interrupted, 2 spines at base of spur, 3 heavier ones above the base of the tarsus, and 1 pre-apical median spine; comb of first tarsal joint with 8–9 spines. Mid legs: anteriorly on the collar-like edge and perpendicularly above the trochanter, the coxa bears 8–9 bristles, 3–4 being stout, as well as a patch of (60–70 minute ones); femur (13 : 4) with 2–8 short bristles antero-subventrally up to three-quarters from the base, otherwise bare, except for numerous minute close-set subdorsal bristles mainly on the apical half; tibial spur thin, a little over three-quarters the first tarsal joint, which bears laterally 6–7 short sharp hyaline (not peg-like) spines; second to fourth tarsal joints bearing 4, 2, and 1 respectively. Hind legs with the coxa (5 : 3) very large, only a little shorter than the femur (7 : 8), very coarsely raised-reticulate on the outer posterior aspect; femur (3 : 1) with a subventral row of about 10 bristles, those on the apical half being longer; between these longer bristles and the dorsal edge are about 20 bristles on the apical third; posteriorly above the tibial impression are 5–6 bristles, while the apical third, as on the anterior surface, bears several minute bristles; tibia moderately flattened (6 : 1), densely clothed with bristles, along the dorsal edge 30 or upwards stouter and hyaline, increasing in length apically, form a conspicuous closely appressed row; at the upper anterior apical angle stand 2 short stout spines, and 2 others not so strong below the middle just clear of the two spurs; the posterior comb consists of 12–13 spines; the first tarsal joint bears ventrally up to 10 clear sharp spines, there being 3 on the second joint, and 1 on the third, besides other finer bristles. In all the tarsi, joints 3–5 are approximately in the ratio 18 : 15 : 21, the fifth being a little longer in the hind tarsus. In the fore legs 1 and 2 are in the same scale 36 : 24, in the mid legs 66 : 30, and in the hind pair 50 : 30.

Abdomen broad (5 : 4), about one-fifth wider than the thorax and one-quarter longer, the sides very convex (tergites 2–4 when flattened out much the broadest), posteriorly shortly pointed. Tergite 1 much the longest (8), 2–5 subequal (about 5), 6 shorter (the exposed part only $2\frac{1}{2}$). In tergite 1 the posterior margin is medianly gently convex, in 2–4 nearly straight, in 6 medianly convex, with a shallow concavity at each side before the spiracle. In the ovipositor the free portion of the sheath (less than one-third of the base) bears 5 bristles proximally and 10 on the pointed apical half; the base bears a row of 7–8 bristles. In the actual ovipositor only the apical one-tenth is serrate, bearing 3–4 rather large subapical teeth.

Length, about $1\frac{1}{2}$ mm.; alar expanse, 3 mm.

GOLD COAST: Aburi, "on cocoa Coccid," 4.i.13, 4 ♀♀ (*W. H. Patterson*).

Type ♀ in the British Museum.

